

# Claims

- [c1] 1. A drained water recovery system, comprising:
- a processing station with at least a water outlet;
  - a first three-way valve connected to the water outlet;
  - a first conductivity analyzer set up on a first pipeline between the processing station and the first three-way valve;
  - a first controller electrically connected to the first three-way valve and the first conductivity analyzer such that the first three-way valve is activated according to a control signal from the first conductivity analyzer;
  - a first recovery tank connected to a first drained water outlet of the first three-way valve;
  - a buffer tank connected to the first recovery tank;
  - a first interim tank connected to the buffer tank;
  - a first raw water tank and a second raw water tank which are both connected to the interim tank;
  - a first valve set up along a second pipeline between the interim tank and the first raw water tank;
  - a second valve set up along a third pipeline between the interim tank and the second raw water tank;
  - a first pump and a second pump set up along the second pipeline and the third pipeline; and
  - a total organic carbon analyzer connected to the buffer tank and electrically connected to the first valve and the second

valve for controlling the opening and closing of the first and the second valve.

[c2] 2. The drained water recovery system of claim 1, wherein the system further comprises a second recovery tank connected to a second drained water outlet of the first three-way valve.

[c3] 3. The drained water recovery system of claim 1, wherein the system further comprises a third valve set up along a fifth pipeline between the buffer tank and the interim tank.

[c4] 4. The drained water recovery system of claim 3, wherein the system further comprises a second conductivity analyzer connected to the buffer tank and electrically connected to the third valve for controlling the opening and closing of the third valve.

[c5] 5. The drained water recovery system of claim 1, wherein the system further comprises a liquid level measuring device set up inside the interim tank for measuring the liquid level inside the interim tank.

[c6] 6. A method for recovering drained water of a processing station, comprising the steps of:  
draining water from the processing station;  
measuring the conductivity of the drained water using a conductivity analyzer;  
channeling the drained water to a recovery tank by controlling

a three-way valve according to the measured conductivity;  
channeling the drained water from the recovery tank into a  
buffer tank;  
channeling the drained water from the buffer tank into an  
interim tank; and  
analyzing the drained water inside the buffer tank using a total  
organic carbon analyzer and re-directing the drained water  
inside the interim tank into a first raw water tank or a second  
raw water tank.

- [c7] 7. The method of claim 6, wherein the step of analyzing the  
drained water inside the buffer tank using the total organic  
carbon analyzer and re-directing the drained water inside the  
interim tank into the first raw water tank or the second raw  
water tank further comprising the steps of:
- (a) performing a first total organic carbon value analysis on the  
drained water inside the buffer tank to determine whether the  
total organic carbon value of the drained water is lower than a  
standard value;
  - (b) determining whether the liquid level inside the interim tank  
is at a first high liquid level when the total organic carbon value  
of the first total organic carbon value analysis is lower than the  
standard value;
  - (c) switching on a first pump, opening a first valve and  
switching off a second valve to channel the drained water into

the first raw water tank when the liquid level inside the interim tank is at the first high liquid level;

(d) performing a second total organic carbon value analysis on the drained water inside the buffer tank to determine whether the total organic carbon value of the second total organic carbon value analysis is lower than the standard value;

(e) determining whether the liquid level inside the interim tank is at a second high liquid level when the total organic carbon value of the second total organic carbon value analysis is lower than the standard value, wherein the second high liquid level is higher than the first high liquid level;

(f) switching on a second pump to speed up the channeling of drained water to the first raw water tank when the liquid level inside the interim tank is at the second high liquid level;

(g) determining whether the liquid level inside the interim tank is at a middle level when the total organic carbon value of the first total organic carbon value analysis is higher than the standard value in step (a);

(h) switching on the first and the second pump, opening the second valve and switching off the first valve to channel the drained water into the second raw water tank when the liquid level inside the interim tank is at the middle level;

(i) performing a third total organic carbon analysis of the drained water inside the buffer tank to determine whether the total organic carbon value of the third total organic carbon

analysis is lower than the standard value;

(j) determining whether the liquid level inside the interim tank is at a low liquid level when the total organic carbon value of the third total organic carbon analysis is lower than the standard value; and

(k) switching off the first and the second pump when the liquid level inside the interim tank is lower than the low liquid level.

[c8] 8. The method of claim 7, wherein in step (d), the following steps are carried out when the total organic carbon value of the second total organic carbon analysis is higher than the standard value:

(l) determining whether the liquid level inside the interim tank is at the middle level;

(m) switching on the first and the second pump, opening the second valve and closing the first valve to channel the drained water into the second raw water tank when the liquid level inside the interim tank is at the middle level;

(n) performing a fourth total organic carbon analysis on the drained water inside the buffer tank to determine whether the total organic carbon value of the fourth total organic carbon analysis is lower than the standard value;

(o) determining whether the liquid level inside the interim tank is at the low liquid level when the total organic carbon value of the fourth total organic carbon analysis is lower than the

standard value; and

(p) switching off the first pump and the second pump when the liquid level inside the interim tank is at the low liquid level.

[c9] 9. The method of claim 8, wherein in step (n), the following steps are carried out when the total organic carbon value of the fourth total organic carbon analysis is higher than the standard value:

determining whether the liquid level inside the interim tank is at the low liquid level; and

switching off the first pump and the second pump when the liquid level inside the interim tank is at the low liquid level.

[c10] 10. The method of claim 8, wherein in step (o), the following steps are carried out when the liquid level inside the interim tank is higher than the low liquid level:

running the first pump and the second pump for a period of time; and

switching off the first pump and the second pump.

[c11] 11. The method of claim 7, wherein in step (f), the following steps are carried out when the liquid level inside the interim tank is lower than the second high liquid level:

determining whether the liquid level inside the interim tank is at the middle liquid level; and

switching off the first pump when the liquid level inside the interim tank is at the middle liquid level.

- [c12] 12. The method of claim 7, wherein in step (i), the following steps are carried out when the total organic carbon value of the third total organic carbon analysis is higher than the standard value:
- determining whether the liquid level inside the interim tank is at the low liquid level; and
- switching off the first pump and the second pump when the liquid level inside the interim tank is lower than the low liquid level.
- [c13] 13. The method of claim 7, wherein in step (j), the following steps are carried out when the liquid level inside the interim tank is higher than the low liquid level:
- running the first pump and the second pump for a period of time; and
- switching off the first pump and the second pump.
- [c14] 14. The recovery method of claim 7, wherein after step (f), further comprising the steps of:
- performing a fifth total organic carbon analysis on the drained water inside the buffer tank and determining whether the total organic carbon value is lower than the standard value,
- determining whether the liquid level inside the interim tank is at the first high liquid level when the total organic carbon value of the fifth total organic carbon analysis is lower than the preset standard value; and

determining whether the liquid level inside the interim tank is at the middle liquid level when the total organic carbon value of the fifth total organic carbon analysis is not lower than the preset standard value; and  
determining whether the liquid level inside the interim tank is at the first high liquid level;  
carrying out the operation in step (c) when the liquid level inside the interim tank is at the first high liquid level; and  
carrying out the operation in step (f) when the liquid level inside the interim tank is not at the first high liquid level.

- [c15] 15. A method of recovering drained water from a processing station, comprising the steps of:
- (a) draining water from the processing station;
  - (b) channeling the drained water to one of a plurality of recovery tanks according to the conductivity of the drained water;
  - (c) channeling the drained water inside one of the plurality of recovery tanks into a buffer tank;
  - (d) channeling the drained water inside the buffer tank into an interim tank;
  - (e) performing a first total organic carbon analysis on the drained water inside the buffer tank to determine whether the total organic carbon value of the first total organic carbon analysis is lower than a standard value;



- (f) determining whether the liquid level inside the interim tank is at a middle liquid level when the total organic carbon value of the first total organic carbon analysis is higher than the standard value;
- (g) switching on a first pump and a second pump, opening a first valve and closing a first valve to channel the drained water into a second raw water tank when the liquid level inside the interim tank is at the middle liquid level;
- (h) performing a second total organic carbon analysis on the drained water inside the buffer tank to determine whether the total organic carbon value of the second total organic carbon analysis is lower than the standard value;
- (i) determining whether the liquid level inside the interim tank is at a low liquid level when the total organic carbon value of the second total organic carbon analysis is lower than the standard value; and
- (j) switching off the first pump and the second pump when the liquid level inside the interim tank is at the low liquid level.

[c16] 16. The method of claim 15, wherein in step (e), the following steps are carried out when the total organic carbon value of the first total organic carbon analysis is lower than the standard value:

- (k) determining whether the liquid level inside the interim tank is at a first high liquid level;

(l) switching on a first pump, opening a first valve and closing a second valve so that the drained water is channeled into a first raw water tank;

(m) performing a third total organic carbon analysis on the drained water inside the buffer tank to determine whether the total organic carbon value of the third total organic carbon analysis is lower than the standard value;

(n) determining whether the liquid level inside the interim tank is at a second high liquid level when the total organic carbon value of the third total organic carbon analysis is lower than the standard value, wherein the second high liquid level is higher than the first high liquid level; and

(o) switching on the second pump to speed up the channeling of drained water into the first raw water tank when the liquid level inside the interim tank is at the second high liquid level.

[c17] 17. The method of claim 16, wherein in step (n), the following steps are carried out when the liquid level inside the interim tank is lower than the second high liquid level:

determining whether the liquid level inside the interim tank is at the middle liquid level; and

switching off the first pump when the liquid level inside the interim tank is at the middle liquid level.

[c18] 18. The method of claim 15, wherein in step (h), the following steps are carried out when the total organic carbon value of

the second total organic carbon analysis is higher than the standard value:

determining whether the liquid level inside the interim tank is at the low liquid level; and

switching off the first pump and the second pump when the liquid level inside the interim tank is lower than the low liquid level.

- [c19] 19. The method of claim 15, wherein in step (i), the following steps are carried out when the liquid level inside the interim tank is higher than the low liquid level:
- running the first pump and the second pump for a period of time; and
- switching off the first pump and the second pump.